

## A new microphthalmous species of *Perigona* Castelnau, 1835 from Ecuador (Coleoptera Carabidae)\*\*\*\*

Pier Mauro Giachino\* - Pierre Moret\*\* - Luca Picciau\*\*\*

\* Settore Fitosanitario Regionale, Environment Park, Palazzina A2, Via Livorno 60, 10144 Torino (Italia). PierMauro.Giachino@regione.piemonte.it

\*\* 13 rue Léo Delibes, F – 31200 Toulouse (France). moret@univ-tlse2.fr

\*\*\* Università di Torino, Di.Va.P.R.A, Entomologia e Zoologia applicate all'ambiente "Carlo Vidano", Via Leonardo da Vinci 44, 10095 Grugliasco (TO) (Italia). luca.picciau@unito.it

\*\*\*\* Results of the WBA Program "Biological Research in South America". VII contribution.

### Abstract

*Perigona* (*Neoperigona*) *belloi* n. sp. is described. It is a microphthalmous species that lives in the Andes of Ecuador, (Cerro Blanco, Pichincha province and Mojanda, Imbabura province), in leaf litter, in the transition zone between the high montane forest and the lower shrub paramo. Its attribution to the subgenus *Neoperigona* Perrault 1988 is based on the elytral chaetotaxy which differs from the other microphthalmous species belonging to the subgenus *Perigona* s. str. and *Cryptoperigona* Perrault, 1985.

**Key words:** Carabidae, Perigonini, *Perigona*, *Neoperigona*, new species, microphthalmy, Ecuador.

### Resumen

Se describe *Perigona* (*Neoperigona*) *belloi* n. sp., especie microftalma de los Andes del Ecuador, (Cerro Blanco provincia Pichincha y Mojanda provincia Imbabura), que vive en la hojarasca del suelo, en la zona de transición entre el bosque montano alto y el subpáramo. Su atribución al subgénero *Neoperigona* Perrault 1988 se basa en la chaetotaxia elytral, diferenciándose de otras especies microftalmas que pertenecen a los subgéneros *Perigona* s. str. y *Cryptoperigona* Perrault, 1985.

**Palabras clave:** Carabidae, Perigonini, *Perigona*, *Neoperigona*, nueva especie, microftalmia, Ecuador.

### Introduction

In 1985 one of the authors (P.M.) collected by sifting, in the Mojanda area (Imbabura Province, Ecuador), a female specimen of an interesting *Perigona* with reduced eyes and pale integuments, clearly different from the other known neotropical microphthalmous species of that genus. In 2006, during an entomological research carried out in Cerro Blanco, above S. José de Minas (Pichincha province, Ecuador), by one of the authors (P.M.G.) with other participants to the "Ecuador 2006" expedition realized by the Association WBA onlus, our friend Cesare Bellò collected by sifting, in the paramo area, two specimens, male and female, conspecific with this new microphthalmous *Perigona*, object of the present note.

### Acronyms

Acronyms for Museums or private Collections are used as follows:

QCAZ: Museo de Zoología, Pontificia Universidad Católica del Ecuador, Quito, Ecuador  
CGi: Giachino Collection, Torino, Italia  
CMo: Moret Collection, Toulouse, France

The following acronyms are used for type material:  
HT: Holotype  
PT, PTT: Paratype (s)

### *Perigona* (*Neoperigona*) *belloi* n. sp. (Figs. 1-5)

Loc. typ.: Ecuador, Pichincha, S. José de Minas, Cerro Blanco, m 3150, S 00°12'37.3" W 78°21'03.0".

Type series: HT ♂, Ecuador, Pichincha, S. José de Minas, Cerro Blanco, m 3150, S 00°12'37.3" W 78°21'03.0", 7.VIII.2006, C. Bellò leg. (CGi). PTT: 1 ♀, Ecuador, Pichincha, S. José de Minas, Cerro Blanco, m 3150, S 00°12'37.3" W 78°21'03.0", 7.VIII.2006, C. Bellò leg. (QCAZ); 1 ♀, Ecuador, prov. Imbabura, Mojanda, versant nord, terre de litière en sous-bois, 3450 m, Pierre Moret legit (CMo).

### Diagnosis

A *Perigona* (*Neoperigona*) species of small size (3.24 – 3.89 mm), characterized by reduced eyes and completely testaceous integuments, whose surface is smooth and glabrous; pronotum transverse, its margins not sinuate before hind angles; elytra with basal groove complete and striae almost completely obsolete, only visible with some difficulty in the middle area of the disc; no discal setae on the third elytral interval; median group of the umbilicated series of the eighth stria arranged linearly.

### Description

Overall length (from the apex of the mandibles to the apex of the elytra) 3.67 mm ♂ and 3.24-3.89 mm ♀♀. Body elongate, relatively slender and depigmented, head and pronotum testaceous, elytra dark brown; legs, antennae and palpomeres testaceous. Integuments bright and glabrous, with vanished microsculpture on pronotum and elytra.

Head relatively large, narrower than the pronotum, with bright integuments but conspicuous microsculpture in the postocular area. Frons flat

to slightly depressed, with evident supraorbital carinae, extending backwards to the level of the first supraorbital seta. Anterior margin of the clypeus subrectilinear, provided with two setae on the anterior angles. Labrum with subrectilinear front margin and provided with 6 setae. Eyes reduced and flattened, two supraorbital setae on each side. Antennae stocky, relatively long and exceeding the base of the elytra when extended backward.

Pronotum slightly transverse (maximum width/maximum length ratio = 1.26 ♂, 1.16-1.28 ♀♀), its maximum width approximately at the anterior third, narrowed towards base which is slightly narrower than the anterior edge; lateral margins slightly and regularly arcuate anterad,

subrectilinear basally, not sinuate before the hind angles. Basal marginal sulcus visible near hind angles but not in the median zone, base slightly arcuate, laterally not emarginate near the hind angles. Front angles obtuse, not prominent; hind angles widely obtuse and rounded apically. Disc barely convex, sleek and glabrous; median groove superficial, slightly drafted. Lateral marginal groove wide and flattened, widened near base; anterior marginal setae inserted inside the marginal groove, roughly on its anterior fifth; basal setae lacking.

Legs sturdy, protarsi with three dilated segments in the male.

Elytra egg-shaped, slightly lengthened (maximum length/maximum width ratio = 1.42 ♂, 1.40-1.45 ♀♀), widened in their posterior half, with maximum width approximately at the middle; not sinuate their but abruptly and rectilinearly convergent at apical fourth. Elytra, in this brachypterous species, coarctate, with entire basal groove from the humeri to the scutellum. Humeri indicated but rounded; post-humeral margin smooth; elytral apices singly rounded. Marginal groove wide and distinct until beyond the posterior discal seta. Disc moderately convex, flattened or slightly depressed in the central area; integuments bright, with vanished microsculpture. Striae almost completely vanished, only visible in low-angled light on the central disc area; basal stria absent.

Elytral chaetotaxy: one basal seta at the beginning of the second stria and another near the apex of the 5<sup>th</sup> interval. No discal setae on the 3<sup>d</sup> interval. Umbilicate series of the eighth stria divided in three clearly distinct groups: a humeral group of 6 setae (the distance between the 5<sup>th</sup> and the 6<sup>th</sup> is longer than the distance between each of the first five setae), a median group of 3 setae, and a distal group of 4 setae.

Aedeagus (figs. 2-4) small, very weakly arcuate in its basal part; median lobe, from lateral view, lengthened, expanded medially, its ventral edge bisinuate. Apex relatively stocky and regularly rounded, slightly folded ventrally; apical blade short and obvious. Inner sac provided with two different crossing structures, derived from some inner sac wall plicae sclerotization: one of them central and tubule-like, vaguely C-shaped, striate and less sclerified; the other one ventral, always C-shaped, but flattened and not striate. Parameres stocky, the left one oval, short, the right one sub-truncate at the apex and vaguely spoon-shaped. Male gonosomite (fig. 5) ovoid, lengthened, provided in the distal part with two vaguely hook-shaped apophysis.

### Etymology

We are pleased to dedicate this interesting spe-

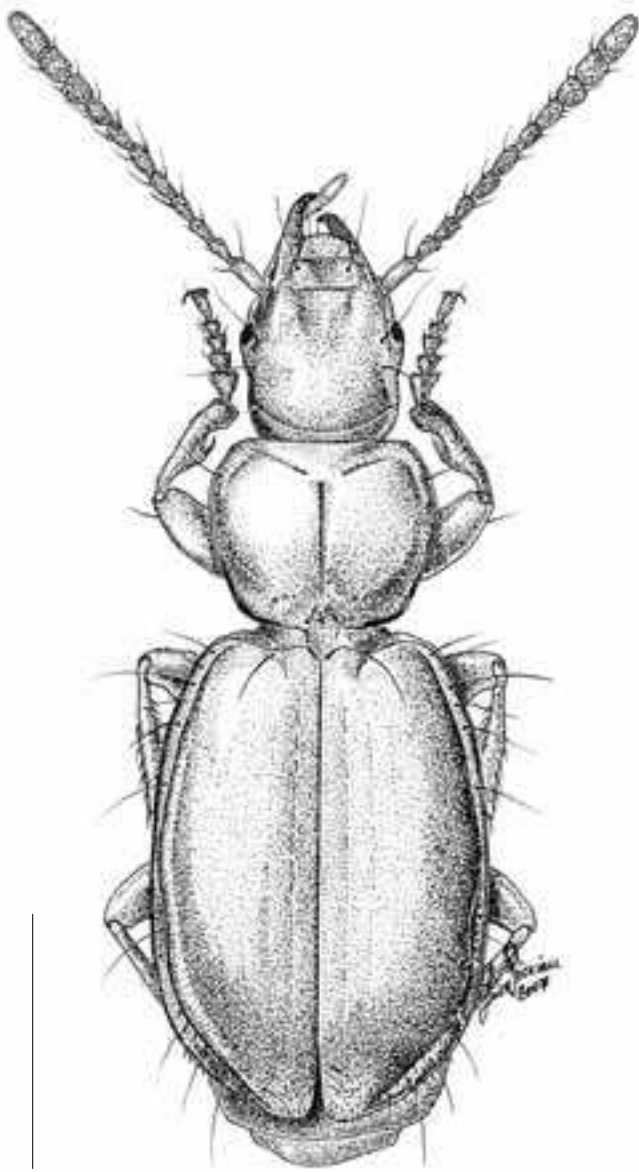
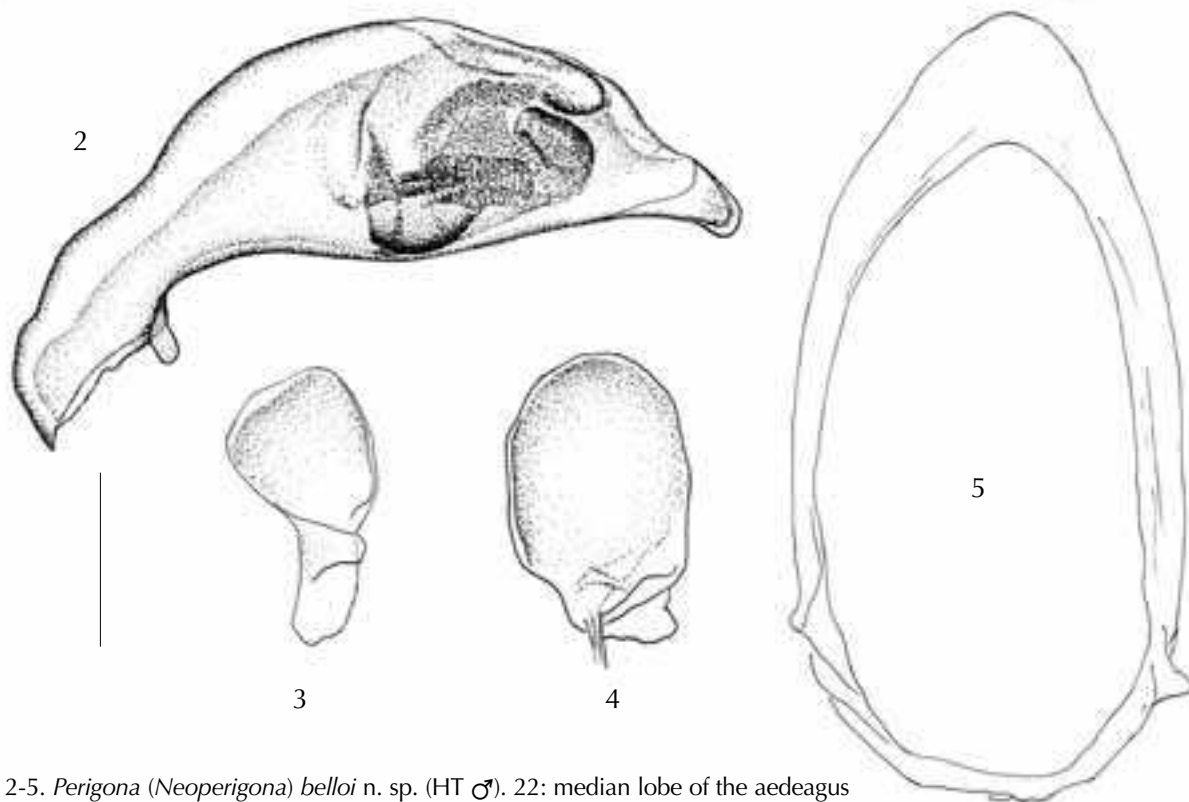


Fig. 1. Habitus of *Perigona* (*Neoperigona*) *belloii* n. sp. (HT ♂). Scale: 1 mm.



Figs. 2-5. *Perigona (Neoperigona) belloi* n. sp. (HT ♂). 22: median lobe of the aedeagus in lateral view; 3: right paramere; 4: left paramere; 5: Male gonosomite. Scale: 0.2 mm.

cies to our colleague Cesare Bellò who collected the male specimen which enabled us to describe the new species.

## Discussion

*P. belloi* n. sp. shows all the character states that define the subgenus *Neoperigona* Perrault, 1988: dorsal surface smooth and glabrous; median group of the umbilicate series arranged linearly (in *Perigona* s. str., one of the setae is shifted inwards, forming a triangle); no discal seta on the 3<sup>d</sup> elytral interval; one preapical seta on the 5<sup>th</sup> interval. The other known species, all neotropical (Perrault, 1991: 398), have big protruding eyes and are macropterous. *Perigona belloi* n. sp. is, for this subgenus, the first known case of a brachypterous species, partially depigmented and microphthalmous.

Two other species of microphthalmous *Perigona* exist in South America. *Perigona (Cryptoperigona) gerardi* Perrault, 1985, was described on two specimens obtained in French Guyana by ground washing. The subgenus *Cryptoperigona*, established for this species (Perrault, 1985: 62), is characterized by obsolete frontal furrows, reduced eyes and erased elytral striae. Other characters indicated in Perrault's diagnosis (particularly the chaetotaxy characters) apply to the subgenus *Trechicus* Le Conte. *Cryptoperigona* cannot be properly separated from *Trechicus*, except for those weak characters that seem to be linked with a

specialized way of life in underground environment, making doubtful the validity of this subgeneric taxon. *P. gerardi* Perrault is easily distinguishable from *P. belloi* n. sp. by its small size (1.9 mm), the presence of two discal setae on the 3<sup>rd</sup> elytral interval and the triangular arrangement of the median group of the umbilicate series.

*Perigona microphthalma* Jeannel, 1950, was described on two specimens from Venezuela. The study of the female holotype and the male paratype, both preserved at the Muséum National d'Histoire Naturelle of Paris (contrary to the indication of Jeannel, 1950: 167, that "the paratype is at the museum of Trieste"), allows to complete and rectify various aspects of the original description. The two specimens carry three identical labels: "El Junquito/Caracas 4-49" (handwritten), "40" (print) and "TYPE" (print). One of them carries a handwritten label "*Perigona* (s. str.) *microphthalma* n. sp." too. This is probably the specimen that Jeannel designated as the "type (female)". The one he indicates as paratype should be the specimens without label. The latter is a male whose dissected aedeagus is fixed on a label (in opposition, once again, to Jeannel's assertion who writes "male unknown"). The original description (Jeannel, 1950: 166-167) is correct, except two items. The pronotum is not "much longer than wide", but as long as wide, and the median group of the umbilicate series has a seta clearly shifted inwards, whereas

Jeannel writes erroneously that the setae of that group are "lined up along the marginal groove". *P. microphthalma* Jeannel resembles the new species described in the present contribution, by the reduction of eye rate and the colour of the integuments, but it differs by an elongate pronotum with posteriorly sinuate sides; elytra with incomplete basal groove, distinct striae and slightly convex intervals; absence of preapical seta on the 5<sup>th</sup> interval and the triangular arrangement of the median group of the umbilicate series.

Georges Perrault inserted *P. microphthalma* Jeannel in his subgenus *Cryptoperigona* (Perrault, 1985: 62). However differences are various, particularly concerning the chaetotaxy: *P. microphthalma* Jeannel has no seta on the 3<sup>rd</sup> interval, while *P. gerardi* Perrault has two. On the other hand, *P. microphthalma* Jeannel cannot be considered as belonging to the nominal subgenus, *Perigona* s. str., because in the latter the setae of the median group of the umbilicate series are lined up and the 3<sup>rd</sup> interstria is provided with three discal setae (Basilewsky, 1989: 423). Its systematic position therefore remains dubious, as long as a revision of the American species groups of *Perigona* is still awaited.

These two species of northern South America belong, in any case, to phyletic lineages that are clearly different from that of the new Ecuadorian species. The latter belongs to a very homogeneous line, the one of the subgenus *Neoperigona* Perrault, which is widely spread in intertropical America (Perrault, 1991: 398).

The majority of the described species of this subgenus come from Brazilian Amazonas: *P. laevilateris* (Bates, 1872), *P. sexstriata* (Bates, 1872), *P. ozaenoides* (Bates, 1872) and *P. praecisus* (Bates, 1872). A fifth species, *P. vixstriata* (Bates, 1872), is cited of Rio de Janeiro's surroundings.

Two other species are known of Central America and Mexico: *P. cordicollis* Bates, 1882 of Guatemala and *P. laevigatus* (Bates, 1872) of Guatemala, Panama and Mexico (Veracruz). According to the material we were able to study in several collections, the subgenus *Neoperigona* Perrault is also present in Nicaragua, Guyana, Colombia and Ecuador. In this last country, in addition to *P. belloi* n. sp., various macropterous species, not described yet, were obtained in forest environments at altitudes between 200 and 2000 m a.s.l..

### Distribution and ecology

*Perigona belloi* n. sp. is known from two distinct localities: Cerro Blanco, m 3150, above S. José de Minas (Ecuador, prov. Pichincha) and Mojanda, m 3450 (Ecuador, prov. Imbabura), less than one kilometre north of Laguna Grande de Mojanda and south of Otavalo. The new species was collec-

ted, in the first locality, by sifting the litter in a secondary open formation of subparamo. In the second locality a single female specimen was also found by sifting in the deep vegetal litter of the uppermost layer of the Andean elfin forest. From these poor data, it can be assumed that the species belongs to the carabid fauna of the transition zone between high montane forest and lower shrub paramo. Other Carabids were found in Mojanda, in the same environment, such as *Dyscolus involucer* Moret, *Dyscolus lignicola* Moret and *Dyscolus* sp. [Platynini], *Blennidus* sp. [Pterostichini] and *Dercylus cordicollis* (Chaudoir) [Dercylini] (Moret, 2005: 251).

From a comparison with the other wingless edaphic species of the same ecosystem, it seems highly probable that *Perigona belloi* n. sp. has a reduced distribution area and is restricted to the Pichincha-Chimborazo area of endemism (Moret, 2005: 208-211).

### Acknowledgements

We are very grateful to Dr. Thierry Deuve of the National Museum of Natural History of Paris, for allowing us to study the type of *Perigona microphthalma* Jeannel.

We also would like to thank all the participants of the "Ecuador 2006" expedition realized by the Association WBA onlus and in particular the researchers: Cesare Bellò, Gianfranco Caoduro, Fulvio Giachino, Margherita Pogliano, Giuseppe Bartolomeo Osella.

A special acknowledgement is due to Prof. Giovanni Onore, president of the Otonga Foundation, for his irreplaceable support in the field and to Prof. Achille Casale of the University of Sassari for his suggestions on the original manuscript.

-.-

### References

- Basilewsky P., 1989. Révision des Perigonini d'Afrique (Coleoptera, Carabidae). *Revue de Zoologie Africaine*, 103: 413-452.
- Jeannel R., 1950. Un *Perigona* microphtalme du Vénézuéla [Coleoptera Perigonidae]. *Revue française d'Entomologie*, 17: 166-167.
- Moret P., 2005. Los coleópteros Carabidae del páramo en los Andes del Ecuador. Sistemática, ecología y biogeografía. Quito, Pontificia Universidad Católica del Ecuador, Centro de Biodiversidad y Ambiente, Monografía 2, Gruppo Editoriale il Capitello, Torino, 306 pp.
- Perrault G.G., 1985. Etudes sur la faune des Carabidae de Guyane. II : Une nouvelle espèce de *Perigona* microphtalme (Coleoptera, Carabidae, Perigonini). *L'Entomologiste*, 41 (2): 61-64.

Perrault G.G., 1988. Notes sur la tribu des Perigonini (Coleoptera, Carabidae) avec les descriptions de deux sous-genres et d'une espèce. Entomologische Blätter, 84 (1-2): 11-16.

Perrault G.G., 1991. Notes sur les types des espèces néotropicales du genre *Perigona* décrites par Bates (Coleoptera, Carabidae, Perigonini). Nouvelle Revue d'Entomologie (N.S.), 8 (4): 398.